

**Pavement Condition Assessment with  
GeoAutomation**

McElhanney Consulting Services Ltd.

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# Pavement Condition Assessment with GeoAutomation

**GeoAutomation is a mobile digital imagery camera system, providing near 360°, survey-enabled, georeferenced imagery capable of mapping accuracies ranging from GPS quality through to the high accuracy survey requirements demanded in Engineering Road Design. With 14, 2MP, digital cameras, this totally optical system is an excellent tool for: Asset Inventory Collection and Management; Pavement Condition Assessment; Topographic mapping data collection; Engineering quality surveys; and 3D modelling.**

(Readers are encouraged to examine the “Introduction to GeoAutomation” White Paper before reviewing this document.)

This Paper describes how GeoAutomation imagery can be used for the assessment of pavement condition on roads and sidewalks.

The Problem:

Asphalt and concrete wear, crack and deteriorate over time. Municipalities have developed different methods of identifying problems. These include:

- Walking the line, taking photographs and notes, possibly with a hand held GPS unit.
- Video reviews, potentially with low accuracy GPS.
- Laser scanning that could be combined with video or digital frame imagery and GPS.

With the introduction of the PSAB 1350 regulations it is now a requirement that Municipalities determine the state of their roads/curbs infrastructure and extrapolate a cost to maintain them over time. Some jurisdictions have now legislated periodic reviews to ensure that these evaluations occur.

Most often these efforts have not been coordinated in any way with other Municipal efforts in asset management or condition assessment. The solutions to date have been one dimensional and stand alone. They have not been part of an integrated solution for asset management.

Pavement assessment efforts can be labour intensive, time consuming and very often weather dependant.

Laser-based pavement inventory and assessment solutions can be very costly and mind numbing in application. As well, this approach is, on one hand, overkill, providing way too much information to store and review. While on the other hand, not providing enough information, as the laser equipped vehicles typically only travel one side of the road.

The Solution:

Utilize GeoAutomation imagery as part of a comprehensive asset management policy of inventory and condition assessment for all assets in a Municipality or jurisdiction. (Readers are encouraged to examine the “Asset Inventory and Topographic Data Collection” White Paper.)

The characteristics of digital imagery create the situation where the locations of cracks in pavement are automatically generated in the image processing stage of GeoAutomation imagery production. The Reader is encouraged to review the White Paper, “Introduction to GeoAutomation” , for a clearer understanding of this process. The images below show the pixel correlated points quite clearly. Note how in Image 1 there are virtually no points in the new pavement on the right.



*Image 1*



*Image 2*

Image 2 illustrates how damaged pavement is automatically and clearly identified. Each of the many thousands of images in a GeoAutomation route has similar ‘tracking points’. These tracking points are included in all GeoAutomation deliveries, providing an immediate resource to identify and categorize problem areas.

The side view cameras can provide excellent coverage of sidewalk conditions.



*Image 3*

Pavement condition inventory and assessment may also include inventory of pavement markings. Once again, the characteristics of GeoAutomation digital imagery allow for the auto location of these markings.



*Image 4*

### **Other points to consider:**

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- GeoAutomation collection is at 3+ lanes per pass.
- Imagery typically takes 2 – 4 weeks to process.
- No weather delays in assessment.
- Easily linked via a plug-in to your GIS or CAD.

## About McElhanney Consulting Services Ltd.

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For over 100 years, McElhanney has provided innovative engineering solutions to municipal, provincial, federal, transportation, and construction clients. With offices in BC, Alberta and Indonesia, we are a multi-discipline consulting firm, offering a complete range of integrated services to answer all your engineering, surveying, planning, mapping and environmental needs.

McElhanney – proud of our success. Proud to help build our communities.

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Or visit: <http://www.mcelhanney.com/mcsl/products/geoautomation.php>

## Additional White Papers on GeoAutomation from McElhanney:

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- Introduction to GeoAutomation
- Asset Inventory and Topographic Data Collection
- 3D Modeling
- Engineering Survey
- Pavement Condition Assessment
- Virtual As-Builts